

FORM PTO-1390 (Modified)
(REV 5-99)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

065691/0212

U.S. APPLICATION NO. (If known) 09/763724
UnassignedINTERNATIONAL APPLICATION NO.
PCT/FR99/02052INTERNATIONAL FILING DATE
August 27, 1999PRIORITY DATE CLAIMED
August 31, 1998**TITLE OF INVENTION**

METHOD FOR OBTAINING AVIAN BIOLOGICAL PRODUCTS

APPLICANT(S) FOR DO/EO/US

Laurent MOLLARD, Agnes MONTILLET, Cecile HORRIERE, Jack LEGRAND and Tan Hung NGUYEN

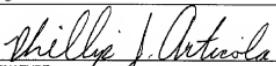
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
 2. This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
 3. This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
 4. A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
 5. A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - is transmitted herewith (required only if not transmitted by the International Bureau).
 - has been transmitted by the International Bureau.
 - is not required, as the application was filed in the United States Receiving Office (RO/US)
 6. A translation of the International Application into English (35 U.S.C. 371(c)(2)).
 7. Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - are transmitted herewith (required only if not transmitted by the International Bureau).
 - have been transmitted by the International Bureau.
 - have not been made; however, the time limit for making such amendments has NOT expired.
 - have not been made and will not be made.
 8. A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
 9. An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
 10. A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).
 11. Applicant claims small entity status under 37 CFR 1.27.
- Items 12. to 17. below concern other document(s) or information included:
12. An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
 13. An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
 14. A FIRST preliminary amendment.
 - A SECOND or SUBSEQUENT preliminary amendment.
 15. A substitute specification.
 16. A change of power of attorney and/or address letter.
 17. Other items or information: Associate Power of Attorney



23533

PATENT TRADEMARK OFFICE

U.S. APPLICATION NO. IFP/PA 57 PCT/FR1.50 Unassigned	INTERNATIONAL APPLICATION NO. PCT/FR99/02052	ATTORNEY'S DOCKET NUMBER 065691/0212			
18. <input checked="" type="checkbox"/> The following fees are submitted:		CALCULATIONS PTO USE ONLY			
Basic National Fee (37 CFR 1.492(a)(1)-(5); Search Report has been prepared by the EPO or JPO.....		\$860.00			
International preliminary examination fee paid to USPTO (37 CFR 1.482).....		\$690.00			
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))		\$710.00			
Neither international preliminary examination fee (37 CFR 1.482) nor International search fee (37 CFR 1.445(a)(2)) paid to USPTO		\$1,000.00			
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)		\$100.00			
ENTER APPROPRIATE BASIC FEE AMOUNT = \$860.00					
Surcharge of \$130.00 for furnishing the oath or declaration later than 20 Months from the earliest claimed priority date (37 CFR 1.492(e))					
Claims	Number Filed	Included in Basic Fee	Extra Claims	Rate	
Total Claims	6	-	20	= 0 x \$18.00	\$0.00
Independent Claims	1	-	3	= 0 x \$80.00	\$0.00
Multiple dependent claim(s) (if applicable)			\$270.00		
			TOTAL OF ABOVE CALCULATIONS = \$860.00		
Reduction by ½ for filing by small entity, if applicable.			\$0.00		
			SUBTOTAL = \$860.00		
Processing fee of \$130.00 for furnishing English translation later the 20 months from the earliest claimed priority date (37 CFR 1.492(f)).			+		
			TOTAL NATIONAL FEE = \$860.00		
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +			\$40.00		
			TOTAL FEES ENCLOSED = \$900.00		
			Amount to be: refunded \$ charged \$		
a. <input checked="" type="checkbox"/>	A check in the amount of \$900.00 to cover the above fees is enclosed.				
b. <input type="checkbox"/>	Please charge my Deposit Account No. 19-0741 in the amount of \$0.00 to the above fees. A duplicate copy of this sheet is enclosed.				
c. <input checked="" type="checkbox"/>	The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 19-0741. A duplicate copy of this sheet is enclosed.				
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO:					
Foley & Lardner Washington Harbour 3000 K Street, N.W., Suite 500 Washington, D.C. 20007-5109					
 SIGNATURE <u>Phillip J. Articola</u> NAME STEPHEN BX MAEBUS for / Reg. No. 38,819 REGISTRATION NUMBER 35,264					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Laurent Mollard et al.

Title: METHOD FOR OBTAINING
AVIAN BIOLOGICAL PRODUCTS

Appl. No.: Unassigned

Filing Date: 2/27/2001

Examiner: Unassigned

Art Unit: Unassigned

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination of the above-identified application, Applicants respectfully request that the following amendments be entered into the application:

IN THE CLAIMS:

4. (Amended) Process according to [one of claims 1 to 3] claim 1, characterized in that the skeletons are ground until a mean particle size of less than about 1 centimeter is obtained.

5. (Amended) Cartilages of avian origin which are obtained according to [one of claims 1 to 4] claim 1.

REMARKS

Applicants respectfully request that the foregoing amendments to Claims 4 and 5 be entered in order to avoid this application incurring a surcharge for the presence of one or more multiple dependent claims.

Respectfully submitted,

Date February 27, 2001

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By Philip J. Artiola Reg. No.
for Stephen B. Maebius 38,819
Attorney for Applicant
Registration No. 35,264

METHOD FOR OBTAINING AVIAN BIOLOGICAL PRODUCTS

The present invention relates to a method for separating and extracting biological products of avian origin. The method allows the production of avian cartilages and of active ingredients which can be extracted from the cartilages thus obtained.

State of the art

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Cartilages are complex tissues which are found in numerous organs in humans and animals.

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Thus, it is possible to remove cartilages from the nasal septa, the larynx, the arterial trachea, the bronchi, the articular surfaces, the cartilages joining the long bones, the xiphoid process of the sternum, and the like.

In chondrichthian fish (shark, dogfish, skate, and the like), the entire skeleton is cartilaginous.

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Cartilages consist of numerous molecules used as active ingredients in human and animal dietetic nutrition, in human and veterinary pharmacy or in cosmetology. Among the best known molecules, there may be mentioned: collagens, hexosamines and glycosaminoglycans (chondroitin sulfate, keratan sulfate, hyaluronic acid).

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The majority of these molecules are up until now extracted from bovine cartilages. However, since the appearance of bovine spongiform encephalitis (BSE), the food, pharmaceutical and cosmetic industries have been worried about a possible contamination of these extracts by the prions which are responsible for BSE and which are difficult to detect.

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The use of chondrichthian fish skeletons may be a solution for replacing products of bovine origin. However, marine resources have quantitative, economic and environmental limits.

It is therefore useful to find another source of cartilages from animals which are abundant and which are recognized as being free of prion diseases. Domestic poultry (chickens, turkeys, ducks, guinea fowl, quails and pigeons) meet these criteria of sanitary safety.

On the skeleton of birds, the cartilages which can be used are found mainly on the process of the sternum (carina), on the articular surfaces, and at the level of the cartilages joining the long bones.

However, these cartilages represent only a very small part of the skeleton of birds and we do not know a process capable of separating them and extracting them efficiently for the purpose of industrial production. Thus, for example, patent US 5 637 321 describes a manual removal, after dissection with a knife, of chicken cartilages which can be used to obtain type II collagen which is useful in the treatment of arthritis. Such a manual method does not allow mass industrial production.

Invention

We have invented a mechanized method which allows the separation and the extraction of cartilages from the skeletons of domestic fowl.

The method consists in grinding skeletons of domestic fowl and subjecting the ground material to a flow of liquid which circulates in a separating vessel. Advantageously, said liquid flow has an ascending vertical component.

It was found to be advantageous to grind the skeletons of fowl in order to obtain particles of less than about one centimeter in size.

The separating liquid which can be used may be simply water or brine consisting of water and an edible salt. In the latter case, cooking salt (NaCl) may be advantageously used to produce a brine containing less than 32.5% of salt.

The shape of the separating vessel as well as the height of the separating liquid are unimportant. What is essential is that the separating liquid should be able to flow freely. The flow rates of the separating liquid are adjusted according to the structure of the skeletons which may vary with the animal species and the age of the fowl. The size of the separating vessel should vary according to the quantities of products to be treated.

As nonexhaustive and nonlimiting examples, Figure 1 as well as the following trials will make it possible to understand the invention more clearly.

Figure 1

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A cycle for separation and extraction of the cartilages occurs according to the principle in Figure 1 (Figure 1 does not give a scale or a dimension for the device).

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The conduit 1 brings water or brine into the separating vessel 3 by means of the pump 2 which regulates the flow rate.

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A ground product of poultry skeletons is introduced into the conduit 4, the valve 5 is opened, the ground product is allowed to descend as far as the bottom of the vessel 3 and above the grid 6.

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The bone tissues remain on the grid 6 whose meshes are less than the size of the particles of ground skeletons. The cartilaginous tissues are carried by the separating liquid to the surface (7) thereof and are discharged by the overflow outlet 8. They are then collected in the sieve 9. The excess liquid is returned via the conduit 10 to the liquid reservoir which is situated upstream of the conduit 1. The bone tissues are discharged by the conduit 11 after opening the valve 12.

It is of course easy to automate the introduction of the ground skeletons into the

separating vessel, the discharge of the cartilages and of the bone tissues by any known means.

Trial 1

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For this trial and for the next trial, the experimental system for separating and extracting cartilages, corresponding to Figure 1, comprises a translucent Plexiglass separating vessel with a capacity of 15 liters.

The pump has a variable output which can be adjusted from 0 to 3 500 liters per hour.

For the purposes of the experiment, the bone tissues are discharged at the end of each experiment by aspirating them with a flexible pipe connected to a suction pump.

In this first trial, turkey skeletons, which are by-products from a slaughterhouse which undertakes the "cutting" of these fowl, are collected.

They are then ground in a mincer commonly used in the industry for prepared meat products, also called a "cutter", until particles of less than one centimeter are obtained.

The separating liquid is brine containing 30% of cooking salt.

The pump is adjusted such that the flow rate of the brine in the separating vessel is 1 500 liters per hour.

After introducing into the separating system a total weight of one kilogram of ground skeletons, 32 grams of cartilages were recovered at the end of the experiment.

Trial 2

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10 kilograms of chicken skeletons which had been coarsely ground in a poultry breeding center are collected.

They are again ground in a mincer so as to reduce the size of the particles to less than one centimeter.

For this experiment, tap water is used as separating liquid.

The capacity of the pump is adjusted such that water goes through the separating vessel at the rate of 3 000 liters per hour.

After the experiment, which was performed on 10 the 10 kilograms of ground chicken skeletons, it was possible to separate and extract 550 grams of cartilages.

Trial 3

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Starting with cartilages obtained in trial 2, the active ingredients which can be used in human and animal dietetic nutrition, in human and veterinary pharmacy or in cosmetology, were evaluated.

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The collagens were assayed according to the method used by the Laréal laboratory, 56250 Saint Nolff, France, and accredited by the French Accreditation Committee, better known by the name COFRAC (reference COFRAC: CC 70; laboratory reference: 25 AN 85; accreditation number: 1-285).

30

The hexosamines were assayed according to the method described in "Techniques d'analyse et de contrôle dans les industries agro-alimentaires", 1981, Volume 4, pages 95-97, published by Technique et Documentation, Lavoisier, APRIA.

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The glycosaminoglycans, which are expressed in the form of chondroitin sulfate, were extracted according to the method of L. Rodén et al (In "Methods in Enzymology. Vol. XXVIII, Complex Carbohydrates, Part B" Edited by V. Ginsburg, Academic Press, 1972, pages 73-140), and assayed according to the method described in Pharmeuropa, 1997, Vol. 9, No., 12, pages 193-196.

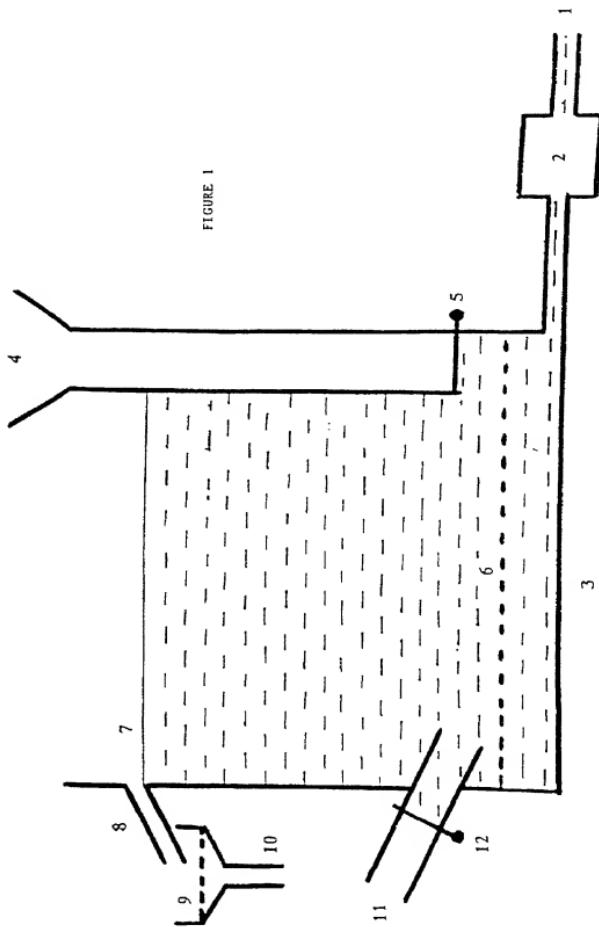
The results obtained were the following, expressed as a percentage by weight of wet cartilages:

- collagens: 8.80%,
- hexosamines: 0.99%,
- glycosaminoglycans: 2.32%.

CLAIMS

1. Method for separating and extracting cartilages of avian origin, characterized in that the cartilages
5 are separated and extracted from ground poultry skeletons by a flow of edible liquid circulating in a separating vessel.
2. Process according to claim 1, characterized in that the flow of edible liquid circulating in a
10 separating vessel has an ascending vertical component.
3. Process according to claim 1, characterized in that the separating liquid is water or an edible brine.
4. Process according to one of claims 1 to 3, characterized in that the skeletons are ground until a
15 mean particle size of less than about 1 centimeter is obtained.
5. Cartilages of avian origin which are obtained according to one of claims 1 to 4.
6. Active ingredients, in particular collagens, hexosamines and glycosaminoglycans, extracted from
20 cartilages of avian origin according to claim 5.

FIGURE 1



DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method for obtaining avian biological products
the specification of which is attached hereto unless the following box is checked:

was filed on August 27, 1999 as United States Application Number or PCT International Application Number PCT/FR 99/02052 and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known by me to be material to patentability as defined in Title 37, Code of Federal Regulations § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)

NUMBER	COUNTRY	DAY/MONTH/YEAR FILED	PRIORITY CLAIMED
98 10868	France	31.08.1998	X

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

APPLICATION NO.	FILING DATE

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is known by me to be material to patentability as defined in Title 37, Code of Federal Regulations § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

APPLICATION SERIAL NO.	FILING DATE	STATUS: PATENTED, PENDING, ABANDONED

I hereby appoint as my attorneys, with full powers of substitution and revocation, to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: Stephen A. Bent, Reg. No. 29,768; David A. Blumenthal, Reg. No. 26,257; William T. Ellis, Reg. No. 26,874; John J. Feldhaus, Reg. No. 28,822; Patricia D. Granados, Reg. No. 33,683; John P. Isaacson, Reg. No. 33,715; Donald D. Jeffery, Reg. No. 19,980; Eugene M. Lee, Reg. No. 32,039; Richard Linn, Reg. No. 25,144; Peter G. Mack, Reg. No. 26,001; Brian J. McNamara, Reg. No. 32,789; Sybil Meloy, Reg. No. 22,749; George E. Quillin, Reg. No. 32,792; Colin G. Sandercock, Reg. No. 31,298; Bernhard D. Saxe, Reg. No. 28,665; Charles F. Schill, Reg. No. 27,590; Richard L. Schwab, Reg. No. 25,479; Arthur Schwartz, Reg. No. 22,115; Harold C. Wegner, Reg. No. 25,258.

Address all correspondence to FOLEY & LARDNER, Washington Harbour, 3000 K-Street, N.W., Suite 500, P.O. Box 25696, Washington, D.C. 20007-8696. Address telephone communications to _____ at (202) 672-5300.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of First or Sole Inventor <u>MOLLARD, Laurent</u>	Signature of First or Sole Inventor 	Date 5.02.2001
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Laurent Mollard et al.

Entitled: METHOD FOR OBTAINING AVIAN BIOLOGICAL PRODUCTS

Serial No.: To be assigned

Filing Date: Concurrently

ASSOCIATE POWER OF ATTORNEY

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

The undersigned attorney of record hereby appoints Stephen B. Maebius,
Registration No. 35,264 as an associate attorney with full power of association, substitution
and revocation, to prosecute the above-identified application and transact all business in the
Patent and Trademark Office connected therewith.

Respectfully submitted,

Date February 27, 2001

By _____



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